IN THE CLAIMS:

1. (Original) An arc tube having a glass tube that is wound into a spiral, wherein the glass tube has an inner shape of a substantially circular cross section, with an inner tube diameter in a range of 5 mm to 9 mm inclusive, and

a bulb wall loading is set so that a temperature of a coldest spot within the glass tube under steady state illumination falls into a range of 60° C to 65° C inclusive.

2. (Original) An arc tube having a glass tube that is wound into a spiral, wherein the glass tube has an inner shape of a substantially elliptical cross section, with an inner tube major axis in a range of 5 mm to 9 mm inclusive and an inner tube minor axis of 3 mm or larger,

a bulb wall loading is set so that a temperature of a coldest spot within the glass tube under steady state illumination falls into a range of 60 °C to 65 °C inclusive.

3. (Original) The arc tube of Claim 1, wherein

the bulb wall loading is set within a range of 0.08 W/cm^2 to 0.12 W/cm^2 inclusive.

4. (Original) The arc tube of Claim 1, wherein

the glass tube is in a shape of double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube.

5. (Original) The arc tube of Claim 3, wherein

the glass tube is in a shape of a double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube.

6. (Previously Presented) The arc tube as recited in one of Claim 5, wherein

the glass tube is formed so as to fit into a cylindrical space of maximum diameter in a range of 30 mm to 40 mm inclusive and maximum length in a range of 50 mm to 100 mm inclusive.

7. (Cancelled)

8. (Previously Presented) The arc tube as recited in Claim 1, wherein elemental mercury is sealed within the glass tube.

9. (Previously Presented) The arc tube as recited in Claim 2, wherein elemental mercury is sealed within the glass tube.

10. (Previously Presented) The arc tube as recited in Claim 3, wherein elemental mercury is sealed within the glass tube.

11. (Previously Presented) The arc tube as recited in Claim 4, wherein elemental mercury is sealed within the glass tube.

12. (Previously Presented) The arc tube as recited in Claim 5, wherein elemental mercury is sealed within the glass tube.

13. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 1.

14. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 2.

15. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 3.

16. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 4.

17. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 5.

18. (Previously Presented) A low-pressure mercury lamp that includes the arc tube as recited in Claim 6.

19. (Previously Presented) In a low-pressure mercury lamp, the improvement of a glass tube comprising:

the glass tube configured to have a shape of double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and

spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube; and

a bulb wall loading is set within a range of 0.08 W/cm^2 to 0.12 W/cm^2 inclusive, so that a temperature of a coldest spot within the glass tube under steady state illumination falls into a range of 60 °C to 65 °C inclusive.

20. (New) In a low-pressure mercury lamp, the improvement of a glass tube comprising:

the glass tube configured to have a shape of double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube, the glass tube has an inner shape of a substantially circular cross section, with an inner tube diameter in a range of 5 mm to 9 mm inclusive; and

a bulb wall loading is set so that a temperature of a coldest spot within the glass tube, under steady state illumination, is substantially equal to an optimum cold spot temperature of the glass tube at which maximum luminous flux is radiated.

21. (New) The low-pressure mercury lamp of Claim 20, wherein the glass tube contains about 3 mg of elemental mercury.